



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/993,779

11/05/2001

Hakan Ozdemir

01-S-046 (1678-48)

7603

30431 7590 12/22/2008

STMICROELECTRONICS, INC.

MAIL STATION 2346

1310 ELECTRONICS DRIVE

CARROLLTON, TX 75006

EXAMINER

MERCEDES, DISMERY E

ART UNIT

PAPER NUMBER

2627

MAIL DATE

DELIVERY MODE

12/22/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 09/993,779	Applicant(s) OZDEMIR, HAKAN	
	Examiner DISMERY E. MERCEDES	Art Unit 2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) 6-20 and 43-48 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 27-36 and 38-42 is/are allowed.
- 6) ☒ Claim(s) 1-5, 21-26, 37, 49 and 50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 2/11/2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/20/2008 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-5,21-23,25-26,37,49-50 are rejected under 35 U.S.C. 102(e) as being anticipated by Christiansen et al. (US 6,369,969).

As to Claim 1, Christiansen et al. discloses a head-connection-polarity detector, comprising: a circuit operable to recover servo data from a servo signal (col.3, lines 4-26) generated by an electromagnetic read-write head that is coupled to the circuit with a connection polarity set during installation of the head (fig.2, MR head 20,30,34 and col.3, lines 1-10 and col.5, lines 15-21-- wherein the polarity of the MR head has been preset-the MR head has a bias layer wherein the polarity of this

Art Unit: 2627

bias layer, and thus the MR head, has been determined during manufacture of the disk drive)); and a determinator coupled to the circuit and operable to determine from the recovered servo data whether the connection polarity is reversed (figs.2-3A-B, 24, col.3, lines 5-20 the polarity of the bias layer of the MR head is determined, and wherein this polarity determines if it has deviated from a preferred polarity and col.5, lines 39-45-determines if the polarity signal indicated that the preferred polarity has been reversed).

As to Claim 2, Christiansen et al. further discloses wherein: the circuit is operable to recover a servo-synchronization mark from the servo signal; and the determinator is operable to determine the connection polarity from the recovered servo-synchronization mark (fig.2, 3B wherein the circuit 71 is operable to recover a synch mark from the read signal from the servo data, and a connection polarity is determined 28 from the synch mark and evaluated to determine if has deviated from a preferred polarity; see also and col.5, lines 25-30).

As to Claim 3, Christiansen et al. further discloses wherein the determinator is operable to generate a signal that indicates the determined connection polarity (see figs.2-3a-b wherein a polarity signal is generated col.3, lines 5-10).

As to Claim 4, Christiansen et al. further discloses wherein the circuit comprises a Viterbi detector (fig.3b, 71 wherein it shows a synch mark detector comprising a Viterbi detector).

As to Claim 5, Christiansen et al. further discloses wherein the circuit is operable to recover the servo data from the servo signal regardless of the connection polarity (fig.3b, 71 the Viterbi detector recovers servo data regardless of the connection polarity, the polarity is detected after the recovery of data).

As to Claim 21, Christiansen et al. further discloses a Viterbi detector operable to recover a synchronization mark from samples of a servo signal generated by an electromagnetic read head that

Art Unit: 2627

is coupled to the Viterbi detector with a connection polarity set during manufacture (see figs.2-3b and respective descriptions thereof; and col.3, lines 1-10 and col.5, lines 15-21-- wherein the polarity of the MR head has been preset-the MR head has a bias layer wherein the polarity of this bias layer, and thus the MR head, has been determined during manufacture of the disk drive); and a comparator coupled to the Viterbi detector and operable to determine if the connection polarity is coupled in an unexpected manner based on the recovered synchronization mark (fig.3b, col.4, lines 20-39 wherein the correlated signal 83 is compared to a threshold and then proceeds to generate a polarity signal, and col.3, lines 8-10 and col.5, lines 39-45--wherein the polarity signal indicates if the polarity of the head is reversed or deviated from the preferred polarity).

As to Claims 22-23 have the same limitations as those treated in the rejection of claims 3 &5 and are met by the reference as discussed above.

As to Claim 25, Christiansen et al. further discloses wherein the comparator is operable to determine the connection polarity by: comparing the recovered synchronization mark to an ideal synchronization mark on a bit-by-bit basis; determining that the connection polarity equals a first polarity if the number of mismatching bits is less than or equal to a first predetermined threshold; and determining that the connection polarity equals a second polarity if the number of mismatching bits is greater than or equal to a second predetermined threshold (col.3, line 26-col.4, line 10; wherein the connection polarity is determined to be the preferred when the signals 58 or 64 does not exceed threshold, and is deviated from the preferred polarity when it exceeds threshold; see also col.4, line 56-col.5, line 13col.4, line 56-col.5, line 13).

As to Claim 26, Christiansen et al. further discloses wherein the comparator is operable to determine the connection polarity by: comparing the recovered synchronization mark to an ideal synchronization mark on a bit-by-bit basis; determining that the connection polarity is positive if the

Art Unit: 2627

number of mismatching bits is less than or equal to a first predetermined threshold; and determining that the connection polarity is negative if the number of mismatching bits is greater than or equal to a second predetermined threshold (col.3, line 26-col.4, line 10 wherein the connection polarity is determined to be the preferred when the signals 58 or 64 does not exceed threshold, and is deviated from the preferred polarity when it exceeds threshold; see also col.4, line 56-col.5, line 13).

As to Claim 37, Christiansen et al. further discloses a disk-drive system, comprising: a magnetic data-storage disk having a surface and operable to store a servo synchronization mark and other servo data (fig.2,18); a motor coupled to and operable to rotate the disk (fig.2) ; a read head having a connection polarity set during installation of the read head and operable to generate a servo signal that represents the synchronization mark and the other servo data (fig.2,20 and col.5, lines 15-21 and 39-45-- wherein the polarity of the MR head has been preset-the MR head has a bias layer wherein the polarity of this bias layer, and thus the MR head, has been determined during manufacture of the disk drive); a read-head positioning assembly operable to move the read head over the surface of the disk (fig.2,vcm); and a servo channel coupled to the read head, the servo channel comprising, a sampling circuit operable to generate samples of the servo signal (fig.4, 72), and a Viterbi detector operable to recover the synchronization mark and other servo data from the samples of the servo signal regardless of the connection polarity of the read head (figs.2-3A-B, wherein the Viterbi detector in conjunction with synch mark detect the synch mark pattern and further detects estimated data sequence (i.e. other data) and col.3, lines 5-20 and col.5, lines 15-21 and 39-45--the polarity of the bias layer of the MR head is determined, and wherein this polarity determines if it has deviated from a preferred polarity, thus a preset polarity has already being set in the head).

Art Unit: 2627

As to Claim 49 is a method claim drawn to the detector of claims 1,5,37 and are rejected for same reasons of anticipation as set forth in the rejection of claims 1,5,37 above.

As to Claim 50, has similar limitations as to those treated in the rejection of claim 1, above, and are met by the reference as discussed above. However Claim 50 also recites the following limitation further disclosed by Christiansen et al.: inverting the samples of the servo signal if the polarity is a second value (fig.6, step 100).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Christiansen et al. in view of Reed et al. (US 6,052,248).

As to Claim 24, Christiansen et al. discloses the detector of claim 21, and further discloses the synchronization mark has pairs and only pairs of consecutive logic 0's and logic 1's (col.3, line 11- col.4, line 39). Although, it is inherent that a Viterbi detector comprises a path metric unit, an add-compare-select unit selecting the best surviving path metric, Christiansen et al. fails to specifically disclose: Viterbi detector comprises, a recovery circuit operable to recover the synchronization mark from the samples of the servo signal by, for each pair of samples, calculating a difference between path metrics for possible states of 00 and 11 of the synchronization mark, and determining a surviving path from the difference, the synchronization mark lying along the surviving path.

Art Unit: 2627

However, Reed et al. discloses a read channel wherein synch recovery is performed using Viterbi sequence detection see col.8, line 56-col.9, line15 and figs.3 & 6 showing the trellis diagram of the Viterbi decoder). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to provide synch recover using Viterbi algorithm as disclosed by Reed et al. and Christiansen et al. because by using maximum likelihood detection (i.e. Viterbi algorithm) it increases the signal to noise ratio and allows for higher data density (col.2, lines 30-35).

Allowable Subject Matter

6. Claims 27-36, 38-42 are allowed.

Independent Claims 27 & 33 are allowable over the prior art of record since the cited references taken alone or in combination do not teach or suggest: synchronization mark and other servo data, the servo signal having a phase that represents a connection polarity set during installation of an electromagnetic read head; and a comparator coupled to the first Viterbi detector and operable to determine if the phase of the servo signal is reversed based on the recovered synchronization mark, in combination with the other limitations in the claim.

Independent Claim 36 is allowable over the prior art of record since the cited references taken alone or in combination do not teach or suggest: a comparator coupled to the first Viterbi detector and operable to determine if the phase of the servo signal is reversed based on the recovered synchronization mark, in combination with the other limitations in the claim.

Independent Claim 38 is allowable over the prior art of record since the cited references taken alone or in combination do not teach or suggest: a phase that represents a connection polarity set during manufacture of the read head; recovering the servo data from the servo signal; and determining whether the phase of the servo signal is reversed based on the recovered servo data.

Art Unit: 2627

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Dovek et al. (US 5,650,887); Mueller (US 3,691,543); Takahashi (US 6,507,447); Bowen et al (US 6,534,974).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DISMERY E. MERCEDES whose telephone number is (571)272-7558. The examiner can normally be reached on Monday - Friday, from 9:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Thi Nguyen can be reached on 571-272-7579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dismery E. Mercedes/
Primary Examiner, Art Unit 2627